

The **German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig** is one of four National Research Centres funded by the German Research Foundation (DFG). Its central mission is to promote theory-driven synthesis and data-driven theory in this emerging field. The concept of iDiv encompasses the detection of biodiversity, understanding its emergence, exploring its consequences for ecosystem functions and services, and developing strategies to safeguard biodiversity under global change. It is located in the city of Leipzig and it's a central institution of the University Leipzig, jointly hosted by the Martin Luther-University Halle Wittenberg, the Friedrich Schiller University Jena and the Helmholtz Centre for Environmental Research (UFZ). Furthermore, it gains support by the Max Planck Society, the Leibniz Association and the Free State of Saxony. More Information about iDiv: www.idiv.de.

Theory in Biodiversity Science (EcoNetLab) is one of the research groups at iDiv. It aims at describing natural communities by network models comprising the species and their interactions. These complex models are used to understand environmental and anthropogenic constraints on biodiversity as well as the consequences of biodiversity changes for ecosystem functions. We offer an international, English-speaking research environment with regular integrative group activities and high-level training in ecological theory, synthesis, advanced statistics and modelling. Our scientific networks provide excellent opportunities for collaborations within iDiv as well as with international research groups. More information on the working group: www.idiv.de/econetlab.

The two PhD projects are part of the **DFG-funded research unit "Spatial community ecology in highly dynamic landscapes: from island biogeography to metaecosystems [DynaCom]"**. *DynaCom* will analyse the interplay of regional processes (dispersal, colonisation) and local interactions (competition, trophic interactions, mutualisms) to assess the dynamics of community composition on island ecosystems. The research unit addresses both terrestrial and coastal marine communities integrating field observation, a large-scale field experiment, modelling and data analysis. The research unit is coordinated at the University of Oldenburg [UOL], Germany, and involves partners at the Technical University Munich [TUM], the Senckenberg Institution in Frankfurt and Wilhelmshaven, the University of Frankfurt, the University of Göttingen [UGOE], the University of Münster and the German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig.

Friedrich Schiller University Jena as the employer offers the following position as soon as possible:

**2 Doctoral Researcher
on the project "Modelling emigration and active dispersal of animals in spatial networks"**

(limited to 3 years, 65 percent of full-time employment, Salary: Entgeltgruppe 13 TV-L)
workplace: iDiv (Leipzig)/ FSU (Jena)

The FSU Jena seeks to increase the number of women in those areas where they are underrepresented and therefore explicitly encourages women to apply. Severely disabled persons are encouraged to apply and will be given preference in the case of equal suitability.

Research topic:

The research program addresses the trait-dependence of emigration and dispersal of mobile animals ranging from small invertebrates (used in experimental work packages) to birds and mammals (in meta-study work packages), which will be integrated and generalised across species groups and traits in a modelling work package. The idea is that not all animal species have the same dispersal capacity. Allometric relationships represent a general principle to formalise the effect of body mass (the primary independent variable) and other traits (e.g. movement mode and feeding type) on dispersal capacities that constrain which of the patches in a spatial network can be reached (second PhD project on active dispersal). The emigration project (first PhD project) aims at overcoming the traditional view that this is a simple linearly density-dependent process with passive drift out of a habitat patch. Together, these novel trait-based concepts of emigration and dispersal will facilitate a non-neutral perspective on spatial processes in island archipelagos or meta-communities of habitat patches. The candidates will complement their analyses by addressing effects of spatial network configurations of islands or habitat patches such as the connectivity leading to different levels of isolation. The two projects will systematically investigate how these spatial constraints affect the metacommunities of actively moving animals. Specifically, both PhD projects will include the following:

- Laboratory or mesocosm experiments on emigration or dispersal processes of invertebrates such as ground beetles;
- Developing quantitative statistical models of emigration or dispersal in meta-studies (mainly vertebrates);
- Analyzing the dynamics of emigration, dispersal and extinctions in complex food webs on large spatial networks of habitat patches or islands.

Job description:

The first PhD project (PhD 7-1) aims at exploring how patch quality affects emigration. More precisely, the successful candidate will employ microcosm experiments to investigate how (1) resource quantity and quality (stoichiometry) drives feeding of a consumer and subsequently the decision to leave a patch, and (2) how predator body size affects the emigration of the consumer. The successful candidate will develop conceptual and mathematical models to describe the data and these models will be used to inform further meta-community models (see below).

The second PhD project (PhD 7-2) aims at developing concepts on active dispersal of animals between habitat patches of spatial networks or islands of archipelagos. This project will be based on literature research, whiteboard discussions and exchange with colleagues. Subsequently, these concepts will be formalised as quantitative hypotheses and tested in controlled mesocosm experiments with invertebrates. Meta-studies using published data on active dispersal of vertebrates (birds and mammals) will generalise these findings.

Finally, both candidates will integrate the results into a simulation model analysing the colonisation-extinction dynamics of populations embedded in complex food webs on large spatial networks. In both PhD projects, the work will also include a scientific exchange with other working groups and presentations at international conferences. In detail, this includes:

- literature search to establish concepts and synthetic data sets;
- conceptual and mathematical formulation of emigration and dispersal relationships;
- establishing and maintaining controlled laboratory or field-mesocosm experiments;
- synthesising the findings in a simulation model;
- write scientific papers on the project in internationally peer-reviewed journals;
- present the research at national and international meetings.

Requirements:

We are searching for applicants with interest in conceptual thinking about animals in meta-communities, a clear drive to develop quantitative models and skills in experimental work with invertebrates. Basic knowledge of R is necessary for the project, skills in more advanced programming languages such as C(++) or Julia are advantageous but not strictly necessary. The following points describe the expected profile:

- necessary degree for starting a PhD in biology, ecology, physics or a similar discipline;
- knowledge of ecological and meta-community theory is important;
- experience in laboratory or mesocosm experiments or meta-studies is desirable;
- skills in statistical analyses of experiments or meta-studies in R are necessary;
- knowledge of C(++), Julia or a similar fast programming language is advantageous;
- excellent communication skills in English – writing and speaking.

Applications with reference file number 273 /2018 are accepted in English **until 30.09.2018** and should include a detailed letter of motivation (“why you apply for this position) with a description of own research interests (“what is driving your interest in ecology”), a curriculum vitae, the contact details of two academic references (email addresses are sufficient) and copies of the MSc/BSc/Diploma certificates. We prefer applications **via our application portal under <https://apply.idiv.de>**. Hard copy applications can be sent to German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig; Prof. Dr. Ulrich Brose; Deutscher Platz 5e; 04103 Leipzig. For queries on the position, please contact Prof. Dr. Ulrich Brose (ulrich.brose@idiv.de) or Dr. Björn Rall (bjoern.rall@idiv.de).

Applying via email is questionable under data protection law. The sender assumes full responsibility.

Please consider our application information: http://www.uni-jena.de/stellenmarkt_hinweis.html.

Please also note the information on the collection of personal data on:

www.uni-jena.de/Universität/Stellenmarkt/Datenschutzhinweis